

Experimental Testing of Contingent Valuation in the  
Valuation of Public Goods

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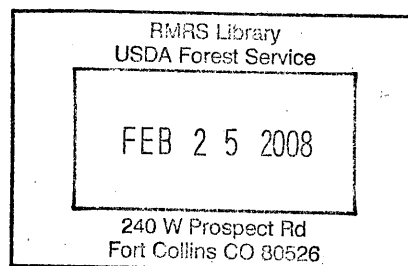
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between  
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## **Preface**

This report consists of a paper suitable for submission to a scientific journal, which summarized the methods and results of the study, and an appendix containing the experimental materials used for the study.

## **Abstract**

Stated preference methods are subject to various biases that may lead to differences between actual and hypothetical willingness to pay. Cheap talk, follow-up certainty scales, and dissonance minimization are techniques for reducing this hypothetical bias. Cheap talk and certainty scales have received attention in the literature, but dissonance minimization has not previously been experimentally tested. Using a split sample design involving over 600 subjects, results from an actual referendum for a quasi-public good were compared with three contingent referenda employing the three bias-reducing techniques. Hypothetical bias was again present. Certainty scales and dissonance minimization were effective in reducing the bias.



## 1. Introduction

Over-estimation of willingness to pay has been a longstanding and important concern among practitioners of stated preference methods (Mitchell and Carson, 1989), and is a manifestation of a much older concern about hypothetical bias (see for example LaPiere, 1934). After reviewing evidence about the relationship between actual and hypothetical willingness to pay, the NOAA expert panel on contingent valuation concluded that “hypothetical markets tend to overstate willingness to pay for private as well as public goods.” (Arrow et al., 1993, p. 4610). The existence of this hypothetical bias has since been verified in many studies comparing contingent to actual willingness to pay, and was recently summarized in meta-analyses by Little and Berrens (2004) and Murphy, et al. (2005). Little and Berrens took ratios from 42 studies; the average ratio was 3.13.<sup>1</sup> Murphy et al. reported several summaries of ratios; the summary that is most similar in methodology to that of Little and Berrens produced a mean ratio of 3.26 (with a median of 1.50).<sup>2</sup> In both meta-analyses the effects of various study design factors on the magnitude of the ratio were examined, including the effect of methods for avoiding hypothetical bias. Both studies found that these methods can be effective, although the evidence does indicate that they differ in their effectiveness.

Three main approaches have been used in the literature to avoid or adjust for hypothetical bias in estimating willingness to pay, with all three approaches appearing in the literature at approximately the same time.<sup>3</sup> The first approach involves the use of follow-up certainty scales, which allow respondents to indicate how sure they are that they would actually pay the amount, or vote as, they just indicated they would. There are two basic versions of this approach.<sup>4</sup> The first uses a numerical scale with labelled end points. For example, Li and Mattsson (1995) used a scale from 0 to 100% in 5% increments where 0% was labelled “absolutely uncertain” and 100% was labelled “absolutely certain”; and Champ et al. (1997) used a 10-point rating scale with 1 labelled “very uncertain” and 10 labelled “very certain”. The other version of the certainty scale approach offers two or more discrete options, each describing a level of certainty.<sup>5</sup> For example, Blumenschein et

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<sup>1</sup> Little and Berrens (2004) updated and extended the meta-analysis of List and Gallet (2001). Most of the 42 studies Little and Berrens examined reported more than one ratio. To avoid over-emphasizing a given study, the authors compiled the median ratio for each study and then computed the mean across the 42 medians. Note that a few of the ratios were for willingness to accept compensation rather than willingness to pay.

<sup>2</sup> Both meta-analyses include some ratios from studies that used methods to reduce hypothetical bias, such as certainty scales or cheap talk. Use of the methods, of course, lowered the numerators and therefore the ratios. When Murphy et al. excluded from the sample the ratios resulting from bias-reducing methods, the mean ratio rose to 5.42, with a median of 2.66. Note that Murphy et al. do not include ratios from willingness to accept compensation bids.

<sup>3</sup> Some authors call these approaches “calibration” techniques, in the sense that they are used to calibrate willingness to pay. However, “calibration” is typically used in reference to a method or model (i.e., the method is calibrated so that it accurately estimates the value of the variable under investigation). We use calibration in this more traditional way, and speak of calibrating the methods used to avoid hypothetical bias so that they provide accurate estimates of actual willingness to pay.

<sup>4</sup> Ready, Whitehead, and Blomquist (1995) offer a completely different way of incorporating uncertainty, replacing the standard dichotomous choice (yes/no) format with a six-part response format with the labels definitely yes, probably yes, maybe yes, and then three similar categories for no.

<sup>5</sup> Ready Navrud, and Dubourg (2001) tried a hybrid of these two versions in the form of six fixed categories some of which included quantified (i.e., 95% sure) estimates of certainty.

al. (1998) used a two-category qualitative scale that allowed respondents to indicate whether they were “probably sure” or “definitely sure” about their prior response. Similarly, Johannesson, Liljas, and Johansson (1998) used the categories “fairly sure” and “absolutely sure”. With both versions, the certainty scale responses are used to switch some of the positive responses to negative.

These studies, and Little and Berrens in their meta-analysis, show that use of follow-up certainty scales can be effective at eliminating the difference between actual and hypothetical mean willingness to pay. The two versions each have their advantages. The advantage of the quantitative scale is that it offers respondents a flexible way to indicate their certainty, as only the end points are labelled and there are various options between the end points. This flexibility, however, comes at a cost in that the scale must be calibrated to the situation at hand. Studies using rating scales have shown that the appropriate certainty cut-off point, below which a yes response is best recoded to no, differs. Champ et al (1997) and Blumenschein et al. (2001) found that including only those who circled 10 on their certainty scale as positive responses and all others as negative produced a mean willingness to pay that was equivalent to actual willingness to pay. In contrast, Ethier et al. (2000) and Poe et al. (2002) found that a cut-off of 7, and Champ and Bishop (2001) and Norwood (2005) found that a cut-off of 8, was needed to produce equivalent results. Thus, the selection of a cut-off remains somewhat arbitrary, although further studies may demonstrate the most commonly occurring point of calibration or devise a way to choose the appropriate point for a given context.

The other version of the certainty scale avoids the need for calibration, but commits to distinct categories. The evidence so far on this qualitative variant is largely encouraging. In three studies using private goods, Blumenschein and colleagues (1998; 2001; forthcoming) found that when the “probably sure” yes responses were recoded to no, leaving only the “definitely sure” yes responses as yes, the null hypothesis of no difference between the corrected hypothetical treatment and the real payment treatment could not be rejected. However, in the Johannesson et al. (1998) study cited above, hypothetical bias was absent from the start and recoding the “fairly sure” yes responses to no reduced the percentages of yes responses significantly below the percentages in the real payment treatment at most bid levels. Thus it seems that more study is needed, including study with public goods, before we can have confidence in the fixed category version of the certainty scale approach.

The second approach that has been used to reduce hypothetical bias, now known as cheap talk, involves use of an entreaty to the respondent prior to presenting the valuation question. The “cheap talk” label was borrowed from experimental economics where it refers to communication between players prior to execution of an experiment. Here cheap talk refers to communication from the experimenter to the participant about things to consider when responding to a subsequent question.<sup>6</sup>

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<sup>6</sup> We define cheap talk as an entreaty to avoid a specified hypothetical bias (typically, over-estimation of willingness to pay). The term has also been interpreted more broadly. For example, Aadland and Caplan (2006) use a script they call cheap talk that warns generally of bias without suggesting the direction of the bias.

The first tests of cheap talk (Cummings, Harrison, and Taylor, 1995; Loomis et al., 1996) used rather short cheap talk scripts that failed to lower hypothetical WTP sufficiently to match actual WTP. Cummings and Taylor (1999) then tried a more lengthy script, which takes about five minutes to read aloud. It has several elements including identification of the problem of hypothetical bias, a numerical example from a previous study demonstrating hypothetical bias, explanation of why hypothetical bias occurs, and a final entreaty to consider opportunity costs and avoid hypothetical bias. Cummings and Taylor found this longer script to be surprisingly effective at reducing hypothetical bias in experiments using public good referenda with student subjects, although only one bid level (\$10) was tested.

Cummings and Taylor's (1999) paper stimulated several other tests of cheap talk scripts. Brown, Ajzen and Hrubes (2003), in another public good referendum study with student subjects, tested the Cummings and Taylor (1999) cheap talk script at several bid levels. They found that the script was very effective at an \$8 bid level, but was less effective or ineffective at lower bid levels.<sup>7</sup> Both List (2001), who used the full (Cummings and Taylor, 1999) script in a second-price auction for a private good, and Lusk (2003), who used a shorter but largely similar script in a dichotomous choice mail survey valuing a private good, found that cheap talk lowered bids for inexperienced consumers but not for experienced ones. Aadland and Caplan (2003), using a very short script in a phone survey, also found evidence that people differ in their susceptibility to cheap talk. Murphy et al. (2005), using the full script in an experiment eliciting individual donations subject to a provision point, found that cheap talk was quite effective at reducing hypothetical bias at bid levels of \$9 and higher but less effective at lower bid levels. Blumenschein et al. (forthcoming), using a script similar to Cummings and Taylor's but without the numerical example, found that cheap talk was completely ineffective at reducing hypothetical bias for a private good in the health industry. Finally, List et al. (2006), using a shorter but similar script to Cummings and Taylor's in a choice study conducted at a sports card show, found that cheap talk removed bias for both experienced (dealers) and inexperienced (nondealers) traders.<sup>8</sup> Importantly, however, they found that subjects in the cheap talk treatment were less consistent in their choices than subjects in either the actual or the hypothetical treatment, suggesting that cheap talk may introduce new biases. In summary, the evidence indicates that cheap talk varies in its effectiveness, but is most effective when the script presents a compelling case for avoiding hypothetical bias, for public goods where respondents are relatively inexperienced with the good being valued, and for moderate to high bid levels – all contexts where hypothetical bias is likely to be greatest.

The third approach, available for use with dichotomous choice or referendum contingent valuation, presents the respondent with response categories beyond the simple yes and no responses. First used by Blamey et al. (1999) and Loomis et al. (1999), this approach, called “dissonance minimising” by Blamey et al., is based on the view that hypothetical bias or yea-saying results from cognitive dissonance, which is an “emotional state set up when two simultaneously held attitudes or cognitions are inconsistent or when

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<sup>7</sup> See also Ajzen, Brown, and Carvajal (2004).

<sup>8</sup> In another choice study, a mail survey of demand for two separate food items, Carlsson et al. (2005) used a very short script and found that cheap talk significantly lowered willingness to pay for seven of ten attributes. Effectiveness could not be tested, however, because a real payment treatment was not included.

there is a conflict between belief and overt behaviour” (Reber, 1985, p. 129). As suggested by Brown et al. (1996), the standard dichotomous choice contingent valuation format may place respondents in the awkward position of choosing between two competing objectives: honestly responding to the bid level and indicating whether or not they favour provision of the good.<sup>9</sup> Respondents who favour the good but suspect that they would not pay as much as they are asked about must choose which objective to pursue, and may choose the latter. The dissonance minimizing (DM) format involves the inclusion of response categories that permit respondents to express support for a program without having to vote in favour of increased expenditure. For example, in the Blamey et al. (1999) study the extra response categories included “I support the [program] ... but it’s not worth \$50 to me”, “I support the [program] ... but I cannot afford \$50”, and “I support the [program] but not if it requires a [fee] of any amount”. By decoupling the choice of whether or not to support the environmental program from the commitment of dollars, this questioning format attempts to reduce dissonance and hypothetical bias.

The results presented by Blamey et al. (1999) and Loomis et al. (1999) were promising. Compared to the hypothetical dichotomous choice results, the DM format resulted in a much steeper bid curve, and there was greater evidence of construct validity. However, neither study included an actual payment treatment; therefore the extent to which this approach was successful in addressing hypothetical bias could not be ascertained.

The purpose of this paper is to investigate the relative effectiveness of these three approaches to reducing hypothetical bias. Using experimental economics procedures in a split sample design, groups of participants voted in actual or contingent payment referenda about provision of a quasi-public good. The four treatments—actual payment, hypothetical with follow-up certainty scale, hypothetical with cheap talk, and hypothetical with DM format—allow for five separate estimates of willingness to pay, as the hypothetical with certainty scale treatment provides two estimates, one without the certainty correction and one with the correction.

In testing for hypothetical bias we acknowledge the perspective of Murphy and Stevens (2004) who noted that with homegrown values it is often not possible to know whether actual stated preferences represent true or “real” preferences because of the possibility of free-riding. That is, it may be that respondents in the actual payment treatment are understating their willingness to pay, which would invalidate the comparison with hypothetical willingness to pay. We do however note the evidence provided by Taylor (1998), which demonstrated that moving from an open to a closed referendum did not significantly affect value estimates. Therefore, removing the possibility of free-riding (via a closed referendum) did not significantly alter willingness to pay. While further studies will demonstrate the generalizability of this finding, it is supportive of the validity of using actual willingness to pay as reference point for determining the extent of hypothetical bias.

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<sup>9</sup> These competing objectives are in addition to those inherent in any dichotomous choice response, which plays the objective of obtaining the good against the objective of preserving disposable income (Ready et al., 1995).

## 2. Description of Experiments

Students participated in sessions that lasted approximately half an hour, for which they were each paid 20 Australian dollars. The sessions had three steps: a trade-off experiment unrelated to the current topic; a questionnaire regarding participants' socio-demographics and general attitudes (see Appendix); and a referendum on provision of a quasi-public good, school childrens' breakfasts provided through the Red Cross. The first two parts served to help mitigate found-money effects on the referendum to follow. In the referendum step, the students participated in one of four treatments: actual payment, hypothetical payment followed by a certainty scale, hypothetical payment with cheap talk, and hypothetical payment with a DM format. The students each had a copy of the questionnaire and followed along as the moderator read the instructions aloud.

The questionnaire for the four treatments are presented in the Appendix. The questionnaires began with a brief outline of what the experiment would involve, followed by a description of the problem—children missing breakfast, particularly in disadvantaged areas, and the consequences thereof. A solution to this problem—the provision of children's breakfasts by the Red Cross—was then described. A justification for collecting funds through a referendum was also provided, as follows:

Because the Red Cross relies on donations, the number of meals it can provide to children each year through the Breakfast Club depends on the funds received. If more money were given, Red Cross would be able to provide meals to needy children who currently are not receiving these meals. So in a moment we are going to ask if you would like, as a group, to contribute money towards the Breakfast Club initiative.

Subjects were then told that if they wanted additional breakfasts to be provided they would need to make a donation. To provide balance to the information provided earlier, the subjects were also given reasons why they might not want to donate and were reminded of their budget constraint.

They were then given an explanation of how the referendum in the experiment would work, as follows (for the \$15 hypothetical treatments):

After you have each voted about whether you want to contribute towards providing a Red Cross breakfast, one of us will collect your voting slips.

1. If more than 50% of you had voted YES to this proposal, all of you would – if this experiment were for real – pay \$15. I would have deducted \$15 from the money that each of you earned for participating in these experiments and a cheque for this amount ( $\$15 \times \text{___ people} = \$\text{___}$ ) would be sent to the Australian Red Cross, who would send each of you a receipt for your contribution.

2. If 50% or fewer of you had voted YES on this proposal, no one would pay \$15, and no money would be sent to the Australian Red Cross.

This description of how the referendum would work was used in each of the hypothetical treatments. In the actual payment treatment a similar description was used, but without the subjunctive language of the hypothetical treatments.

Next, for each treatment except cheap talk a short review was followed by the referendum question. In the cheap talk treatment the full Cummings and Taylor (1999)



cheap talk script, complete with numerical example, was presented prior to the short review. We made only minor modifications to the Cummings and Taylor script to allow for differences in the good that was valued.

For each of the treatments except that using the DM format, the referendum question had two response categories (basically, vote yes or vote no). The DM format had an additional four categories (the second through to the fifth categories), as follows:

- I would vote YES to this proposal that everyone contribute \$15 to the Breakfast Club.
- I support the goal of the Breakfast Club, but I'm not prepared to pay \$15 and thus would vote NO.
- I support the goal of the Red Cross Breakfast Club, but I cannot afford \$15 and thus would vote NO.
- I support the goal of the Red Cross Breakfast Club, but I would prefer to save my money and contribute to another cause and thus would vote NO.
- I support the goal of the Breakfast Club initiative, but I would vote NO for the following reason\_\_\_\_\_.
- I would vote NO to this proposal that everyone contribute \$15 to the Breakfast Club.

Loomis et al. (1999) used only three categories, the standard yes and no and a third stating that "I would vote for program \_\_\_\_\_ only if the cost to my household were less than \$C per year." Blamey et al. (1999) used five categories, which subsume the three of the Loomis et al. study. Three of the Blamey et al. categories are very similar to the first three above, except for changes to reflect differences in the good and payment vehicle. We passed over Blamey et al.'s last two categories (support program but not if it requires a levy of any amount, do not support program at any cost) because they seemed either redundant with prior categories or inappropriate with the current good, and added the last three categories above, two of which (the fourth and fifth) are an attempt to offer a more comprehensive list of reasons for why one might wish to vote no.

After the referendum question, in each of the hypothetical treatments a certainty question was asked. Similar to the majority of previous studies that have used certainty scales, a ten-point certainty scale was used, with the labels "very uncertain" and "very certain" positioned at either end of the scale.

Four focus groups were held to refine the draft questionnaires for each of the four treatments. The focus groups provided some initial qualitative insights about the likely effects of the cheap talk and DM treatments in reducing hypothetical bias. For the cheap talk treatment, some participants indicated that they thought it helped them to give more accurate responses, as in the following three examples: "Slowed down the decision – made me think a bit longer"; "Made me think how I'd really spend it"; and "I think it is a valid point, I changed my answers...would probably lead to more accurate answers". However, other participants thought that they were being inappropriately persuaded to vote no, as in the following two examples: "Seemed as if it were a persuasion to say no...If you're not saying no you're not being honest"; and "The part where it says if you vote yes you're being a good person...and then if I say no does that mean I'm a bad person?" Participants

also indicated that the cheap talk script tended to devalue the good in addition to encourage them to answer realistically.

Participants generally reacted favourably to the DM format. The reduction in dissonance is evident in the following two quotes: “If you want people to say no if they really mean no it’s given them an option where they can say no and still feel good about themselves”; and “A relief...I can say why I’m not [going to vote yes]...it removes some of the guilt so you can give an honest answer”. Participants did, however, have some concerns about the additional categories in the DM treatment. Participants recommended the inclusion of the category “I support the goal of the Red Cross Breakfast Club, but I would prefer to save my money and contribute to another cause”. They also objected to the phrase in “but it’s not worth \$X to me” used in the Blamey et al. study. Participants thought the phrase was value laden and preferred use of the phrase “but I’m not prepared to pay \$X”, which was adopted in the final questionnaire, as noted above.

### 3. The Sample

Students from four campuses and three faculties of Charles Sturt University, a regional university in New South Wales, participated in the experiments presented in this paper. A total of 610 students were included in the final sample. Students studying education were excluded from the sample because of the nature of the good. Students who were working full-time were also excluded to increase the homogeneity of the sample, although this did not influence the final results. The sample sizes for each of the treatments, at each of the bid levels (\$10, \$15, and \$20), are shown in Table 1.

The socio-demographic and attitudinal characteristics of subjects in each of the treatments at each bid level are shown in Table 2. The variables presented in this table are those that were found to be significant regressors in regression analysis that will be reported shortly. While responses to the attitudinal question INTEREST were relatively consistent across treatments, more substantial differences were found for the socio-demographic variables. In particular, the percentage of female students ranged from 21% to 63% while those working part-time ranged from 34% to 61%, indicating some socio-demographic heterogeneity across treatments.

### 4. Results

The percentages of respondents voting yes in the actual payment treatment, in the hypothetical treatment without correction, and with the three bias-reducing approaches are presented in Table 3 and Figure 1. Several findings are apparent. First, the actual payment bid curve is relatively flat, and a binomial z-test indicates that the percentage of subjects supporting payment does not differ significantly across the bid levels. We expect that this has resulted from the good chosen for this experiment. When selecting a good for this research, students were surveyed to identify a public good that they would be most willing to pay for, and Red Cross Children’s Breakfasts was the good indicated most often. It is possible that this insensitivity to cost reflects the importance of this public good to the subset of students willing to pay for its provision. While this means that use of the actual payment data to estimate consumer surplus is problematic, the central concern of this paper—the ability of the three main calibration procedures to mitigate hypothetical bias across a range of bid values—can still be tested. The second finding, which is consistent

with many previous studies, is that the percentage of respondents voting yes in the hypothetical treatment without calibration (61% across all three bid levels) is much greater than for the actual payment treatment (46%). The results from binomial z-tests (Table 4) indicate that these differences are significant.

Of most interest is the relative effectiveness of the three calibration approaches in dealing with hypothetical bias. Inspection of Table 3 and Figure 1 suggests that a certainty correction using a rating of 7 as the cut-off and the DM approach were both successful at eliminating hypothetical bias. Binomial z-test results confirm this finding (Table 4). However, there is evidence that the use of the full cheap talk script appears to have over-corrected, with the binomial z-test results indicating significant differences at the 10% level for two of the bid values and at the 1% level for the remaining bid level.

Regarding the certainty scale, it is of interest to examine the effects of various cut-offs. As Figure 2 shows, using a cut-off of 8 (i.e., recoding as a no response those yes respondents with a certainty response of 7 or lower) will under-estimate actual percentage voting yes. Using a cut-off of 6 or 7 yields a reasonable approximation of the actual payment percentages, with the cut-off of 7 slightly out-performing the cut-off of 6.

While analysis of the raw results provides some information about treatment effects, the existence of heterogeneity across treatment cells suggests the need to use regression analysis to allow for differences in respondents' socio-demographic characteristics and attitudes. Regression analysis also reduces the probability of Type 1 errors by jointly analysing treatment effects across the three bid levels. The results from two binary logit regressions are reported in Table 5. Pooled models are estimated with dummy variables used to capture treatment effects. The regressions have moderate explanatory power as indicated by the rho-square values. Rho-square is a pseudo- $R^2$  measure but it has a different metric, with values of 0.2 to 0.4 equivalent to values of 0.7 to 0.9 in linear regression (Louviere, Hensher and Swait 2000). Several socio-demographic variables were found to be significant, which is indicative of construct validity. Two of these variables – SELF-RESPONSIBLE and WORK PART-TIME – are related to income. As expected, these variables indicate that if you are responsible for your own tuition and living expenses your willingness to pay will be lower, and if you work part-time your willingness to pay will be higher. The other two significant covariates are FEMALE and INTERESTED; these coefficients indicate that females and those who are interested in the good are more likely to vote in favour of the referendum.

The results from the regression analyses confirm the findings reported earlier, namely that the DM and certainty-7 correction were effective at mitigating hypothetical bias. In both models the coefficient for the dummy variable representing the DM estimate is insignificant, indicating that there is no significant difference between the DM treatment and the actual payment (which is the missing category). The certainty-7 correction is included as a dummy variable in Model 2 in place of the dummy variable for the uncorrected hypothetical estimate. The coefficient for this dummy variable is also insignificant, indicating that the use of the certainty-7 correction has dealt with the hypothetical bias.

The evidence from the regression analysis also confirms the earlier finding that the use of the full cheap talk script has over-calibrated potential hypothetical bias. In both models

the coefficient for the cheap talk dummy is significant at the 5% level. Of interest is the magnitude of this coefficient in Model 1; it is about the same size as the coefficient for the hypothetical treatment without correction. The over-correction from cheap talk is about equal in magnitude to the hypothetical bias.

Before leaving the discussion of results, a final question to consider is whether four additional categories were needed for the DM treatment. The distribution of responses across each of the additional categories is shown in Table 6. The most commonly chosen DM categories were the second and third ones, that is “I support the goal of the Red Cross Breakfast Club, but I cannot afford \$15 and thus would vote NO” and “I support the goal of the Red Cross Breakfast Club, but I would prefer to save my money and contribute to another cause and thus would vote NO”. The remaining two categories, particularly the fill-in-the-blank category (“I support the goal of the Breakfast Club initiative, but I would vote NO for the following reason \_\_\_\_\_”) were much less frequently chosen and could potentially be dropped without affecting the efficacy of this approach.

## 5. Discussion

This study offers promising results about the ability to adjust for hypothetical bias. First, further evidence has been provided about the effectiveness of follow-up certainty scales. The finding that a cut-off rating of 7 produces estimates that match actual payments in this study adds to the majority of studies that have found a cut-off of either 7 or 8 is needed to equalise hypothetical and actual willingness to pay. Second, the DM approach as implemented was equally effective in mitigating hypothetical bias. There was also some evidence that less than four additional categories may be needed when using the DM approach. Compared to both certainty scales and cheap talk, this approach has received limited attention in the literature. The findings from this study suggest that more research into its ability to reduce hypothetical bias is warranted to examine the generalizability of the results from this study across alternative public goods, across cultures, and in field trials.

Unlike the other two approaches, cheap talk over-corrected for hypothetical bias. This was unexpected, as the Cummings and Taylor (1999) script has performed well or under-corrected in other applications. The over-correction in this case may reflect cultural differences between the United States and Australia in terms of tendencies for yea-saying behaviour. Indeed the findings of Sinden (1988), the only other study conducted in Australia that compared hypothetical and actual willingness to pay, suggests that hypothetical bias may be less pervasive in Australia than in the United States. Possibly a shorter and weaker entreaty would have been more effective at correcting for hypothetical bias. However, the apparent sensitivity of cheap talk to cultural changes, to the experience trading or knowledge about the good, and even to bid levels, and the long length of the most successful scripts, suggest that other approaches such as the use of certainty scales and possibly DM formats may offer practitioners more reliable and practical means for reducing hypothetical bias.

That said, it is clear that all three approaches can eliminate hypothetical bias if properly calibrated and worded for the given context, and that each approach has its shortcomings and strong points. Summarizing the shortcomings, (1) cheap talk and categorical certainty scales have been found to over-correct in some situations, such as

when no bias is present, and under-correct in others, such as with experienced consumers; (2) the DM format cannot be used with open-ended responses, and in its current form is not appropriate for use with private goods; (3) quantitative certainty scales require selection of the cut-off point, and the appropriate cut-off seems to differ across contexts; and (4) cheap talk, categorical certainty scales, and the DM format may all need some calibration in the form of wording changes to suit a given context.

We now take a step back and ask what this and related studies tell us about hypothetical bias? Although there have been many tests for hypothetical bias and quite a few successful attempts to make it go away, there has been relatively little effort to understand the reason for hypothetical bias, at least as it occurs with monetary bidding. One study that did attempt to explain hypothetical bias and to focus on individual differences, by Ajzen et al. (2004), asked subjects, in the context of public good referenda, a substantial set of questions about their attitudes and beliefs regarding the good (scholarships for needy students) and paying for the good.<sup>10</sup> They posited two hypotheses as possible explanations for hypothetical bias and then used responses to the attitude and belief questions to test the hypotheses. The first hypothesis was that hypothetical bias is simply due to the subset of respondents who are on the fence, for whom the less demanding hypothetical context allows a positive response when the more demanding actual payment context does not do so. The other hypothesis is that the hypothetical and real payment contexts are fundamentally different, generating quite different beliefs and attitudes about the good and its provision, with the hypothetical payment context generating more positive beliefs and attitudes about the good and about paying for the good than the real payment context. Examining responses to extensive questionnaires filled in by the bidding participants, Ajzen et al. concluded that the latter hypothesis was more likely to be the explanation for the hypothetical bias they observed. Specifically, they found that subjects' beliefs about what others (family members and friends) would think if the subjects spent their money to support the scholarship effort—beliefs that were more negative in the actual payment condition than in the hypothetical payment condition—seemed to most clearly separate the two groups.<sup>11</sup>

We suggest that these two hypotheses are not mutually exclusive, and specifically that the difference in beliefs that separates the hypothetical from the real payment condition only matters for those people who are ambivalent in the hypothetical payment situation. We come to this conclusion by reviewing the evidence from induced value and private good studies. First, because hypothetical bias is absent in induced value experiments (Taylor et al., 2001; Vossler and McKee, 2006, Mitani and Flores, 2007), where the value of the good is in monetary terms (i.e., is precise and quantitative), we conclude that hypothetical bias is not a habitual and unavoidable response, and suggest that hypothetical

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<sup>10</sup> Another exception is the work of Champ et al. (1997) and Champ and Bishop (2001). Comparing attitudes expressed by respondents in an actual payment treatment with attitudes of respondents in a hypothetical payment treatment, they found that respondents to the hypothetical payment question who indicated high certainty on a quantitative follow-up certainty scale were quite similar to respondents in the other treatment who actually paid for the good, and dissimilar to those of lower certainty.

<sup>11</sup> The Ajzen et al. study was complicated by the fact that they examined bidding for a public good, where a complex combination of motives or behaviors may explain the observed bias. Studies similar to Ajzen et al.'s are needed that focus on private goods, where the possible reasons for the bias are fewer and therefore easier to detect.



bias may be related to the lack of precision introduced when the good is not simply provided at a given monetary amount. Second, because the bias often occurs for private goods, we must conclude that public-spirited motives or attempts to encourage provision of the good (which may play a role in hypothetical bias observed in public good valuations) are not a necessary condition for bias to occur.<sup>12</sup> Thus, we suspect that the bias is related to uncertainty about one's willingness to pay for the good.<sup>13</sup> Some subjects in bidding experiments act as if they have only a vague notion of their willingness to pay for the good, as if their willingness to pay were represented by a range rather than a point. This is not a new idea; Opaluch and Segerson (1989), Duborg, Jones-Lee, and Loomes (1994), Gregory et al. (1995), Ready, et al. (1995), Wang (1997), Murphy et al. (2004), and undoubtedly others have suggested that imprecision of preference can be characterized by a preference range. Using this range metaphor for the ambivalence that we observe, if the posited price falls above the range, a no response to a dichotomous choice bid question is forthcoming, but if the posited price falls within the range, subjects asked a hypothetical question have little or no incentive to do other than say yes. It is only when they are faced with the possibility of a real economic commitment that subjects are forced to consider the risk of paying too much (and what they and others would think of them paying so much) for the good, leading them to narrow the range and perhaps say no.

Valuation of public goods introduces another possible cause, or set of related causes, of hypothetical bias—that respondents may wish to express support for the good, may wish to be seen as or to think of themselves as public-spirited, or may wish to encourage provision of the good (to the extent that they think their response may make provision more likely, and especially if they think they will escape payment). The success of the DM treatment that we report here suggests that such motives exist. Interestingly, the DM treatment apparently also corrected for any imprecision about the value of the good that might also have elevated the mean hypothetical bid above the mean actual bid. Perhaps the response options “but I’m not prepared to pay \$x” and “but I cannot afford \$x” subsume the simple imprecision that surfaces with private goods.

In summary, we tested three methods for reducing hypothetical bias in referendum contingent valuation and found considerable success, but our efforts contribute only modestly to understanding the underlying causes of hypothetical bias. Not content to leave it there, we examined the work of others, especially induced value and private good experiments, in an attempt to isolate a viable hypothesis for why hypothetical bias occurs. These less complicated bidding scenarios point to a parsimonious hypothesis, focusing on value imprecision, which appears to have considerable support in the literature—that the

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<sup>12</sup> Cummings, Harrison, and Rutsröm (1995) suggested that subjects in their experiments on bidding for a private good may have interpreted the hypothetical dichotomous choice question as asking whether they, the subjects, would *ever* pay \$x for the good. However, private good studies wherein attempts were made to avoid this interpretation by urging subjects to respond as if the purchase were occurring “here and now” (Blumenschein et al., 1998; Blumenschein et al., 2001; Johannesson et al., 1998) nevertheless found substantial bias.

<sup>13</sup> Murphy and Stevens (2004) raise the possibility that the reason for hypothetical bias with private goods is quite different from that for public goods—that in bidding for private goods people may actually report their true willingness to pay when the question is hypothetical but truncate their bids at the market price (net of transaction costs) when payment is for real. We discount this possibility based on the observation that in experiments using commonly available market goods mean hypothetical bids tend to be much below the market price of the goods and real payment bids tend to be much closer to the market price.

lack of consequences allows respondents in hypothetical payment situations to respond based on what are likely to be quite vague notions of willingness to pay, and that the imposition of economic consequences encourages more careful consideration of one's willingness to pay in an effort to avoid paying what seems, or what may later seem, like too much. This, however, does not account for motives that may also influence bidding in public good experiments, such as the desire to express support for the good or to nurture a self image of generosity. Such motives may widen the range in willingness to pay beyond what would exist for a private good, and open the door for bias reducing techniques that addresses such motives.

## References

- Aadland, D., & Caplan, A. J. 2003. Willingness to pay for curbside recycling with detection and mitigation of hypothetical bias. *American Journal of Agricultural Economics* 85(2): 492-502.
- Aadland, D., & Caplan, A. J. 2006. Cheap talk reconsidered: new evidence from CVM. *Journal of Economic Behaviour and Organization* 60: 562-578.
- Ajzen, I., Brown, T. C., & Carvajal, F. 2004. Explaining the discrepancy between intentions and actions: the case of hypothetical bias in contingent valuation. *Personality and Social Psychology Bulletin* 30(9): 1108-1121.
- Arrow, K., Solow, R., Portney, P. R., Leamer, E. E., Radner, R., & Schuman, H. 1993. Report of the NOAA Panel on Contingent Valuation (Vol. 58, pp. 4601-4614). Federal Register.
- Blamey, R. K., Bennett, J. W., & Morrison, M. D. 1999. Yea-Saying in Contingent Valuation Surveys. *Land Economics* 75(1): 126-141.
- Blumenschein, K., Blomquist, G. C., Johannesson, M., Horn, N., & Freeman, P. forthcoming. Eliciting willingness to pay without bias: evidence from a field experiment. *Economic Journal*.
- Blumenschein, K., Johannesson, M., Blomquist, G. C., Liljas, B., & O'Connor, R. M. 1998. Experimental results on expressed certainty and hypothetical bias in contingent valuation. *Southern Economic Journal* 65(1): 169-177.
- Blumenschein, K., Johannesson, M., Yokoyama, K. K., & Freeman, P. R. 2001. Hypothetical versus real willingness to pay in the health care sector: results from a field experiment. *Journal of Health Economics* 20: 441-457.
- Brown, T. C., Ajzen, I., & Hrubes, D. 2003. Further tests of entreaties to avoid hypothetical bias in referendum contingent valuation. *Journal of Environmental Economics and Management* 46(2): 353-361.
- Brown, T. C., Champ, P. A., Bishop, R. C., & McCollum, D. W. 1996. Which response format reveals the truth about donations to a public good? *Land Economics* 72(2): 152-166.
- Carlsson, F., Frykblom, P., & Lagerkvist, C. J. 2005. Using cheap talk as a test of validity in choice experiments. *Economic Letters* 89(147-152).
- Champ, P. A., & Bishop, R. C. 2001. Donation payment mechanisms and contingent valuation: An empirical study of hypothetical bias. *Environmental and Resource Economics* 19: 383-402.

- Champ, P. A., Bishop, R. C., Brown, T. C., & McCollum, D. W. 1997. Using donation mechanisms to value nonuse benefits from public goods. *Journal of Environmental Economics and Management* 33: 151-162.
- Cummings, R. G., Harrison, G. W., & Rutstrom, E. E. 1995. Homegrown values and hypothetical surveys: Is the dichotomous choice approach incentive-compatible? *American Economic Review* 85(1): 260-266.
- Cummings, R. G., Harrison, G. W., & Taylor, L. O. 1995. *Can the bias of contingent valuation surveys be reduced? Evidence from the laboratory.* Working Paper. Atlanta, GA: Georgia State University.
- Cummings, R. G., & Taylor, L. O. 1999. Unbiased value estimates for environmental goods: A cheap talk design for the contingent valuation method. *American Economic Review* 89(3): 649-665.
- Dubourg, W. R., Jones-Lee, M. W., & Loomes, G. 1994. Imprecise preferences and the WTP-WTA disparity. *Journal of Risk and Uncertainty* 9: 115-133.
- Ethier, R. G., Poe, G. L., Schulze, W. D., & Clark, J. 2000. A comparison of hypothetical phone and mail contingent valuation responses for green-pricing electricity programs. *Land Economics* 76(1): 54-67.
- Johannesson, M., Liljas, B., & Johansson, P.-O. 1998. An Experimental Comparison of Dichotomous Choice Contingent Valuation Questions and Real Purchase Decisions. *Applied Economics* 30: 643-647.
- LaPiere, R. T. 1934. Attitudes vs. actions. *Social Forces* 13(2): 230-237.
- Li, C.-Z., & Mattsson, L. 1995. Discrete choice under preference uncertainty: an improved structural model for contingent valuation. *Journal of Environmental Economics and Management* 28: 256-269.
- List, J. A. 2001. Do explicit warnings eliminate the hypothetical bias in elicitation procedures? Evidence from field auctions for sportscards. *American Economic Review* 91(5): 1498-1507.
- List, J. A., & Gallet, C. A. 2001. What experimental protocol influence disparities between actual and hypothetical stated values? *Environmental and Resource Economics* 20: 241-254.
- List, J. A., Sinha, P., & Taylor, M. H. 2006. Using choice experiments to value non-market goods and services: Evidence from field experiments. *Advances in Economic Analysis and Policy (Berkeley Electronic Press)* 6(2, article 2).
- Little, J., & Berrens, R. 2004. Explaining disparities between actual and hypothetical stated values: Further investigation using meta-analysis. *Economics Bulletin* 3(6): 1-13.
- Loomis, J., Brown, T., Lucero, B., & Peterson, G. 1996. Improving validity experiments of contingent valuation methods: Results of efforts to reduce the disparity of hypothetical and actual WTP. *Land Economics* 72(4): 450-461.
- Loomis, J., Traynor, K., & Brown, T. 1999. Trichotomous choice: A possible solution to dual response objectives in dichotomous choice contingent valuation questions. *Journal of Agricultural and Resource Economics* 24(2): 572-583.
- Louviere, J.J., Hensher, D.A., & Swait, J.D. 2000. *Stated Choice Methods: Analysis and Application.* Cambridge University Press, Cambridge.

- Lusk, J. L. 2003. Effects of cheap talk on consumer willingness-to-pay for golden rice. *American Journal of Agricultural Economics* 85(4): 840-856.
- Mitani, Y., & Flores, N. 2007. *Hypothetical and real bias in threshold public goods experiments*. Boulder, CO: University of Colorado.
- Mitchell, R. C., & Carson, R. T. 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington, D. C.: Resources for the Future.
- Murphy, J. J., Allen, P. G., Stevens, T. H., & Weatherhead, D. 2005. A meta-analysis of hypothetical bias in stated preference valuation. *Environmental and Resource Economics* 30: 313-325.
- Murphy, J. J., & Stevens, T. H. 2004. Contingent valuation, hypothetical bias, and experimental economics. *Agricultural and Resource Economics Review* 33(2): 182-192.
- Murphy, J. J., Stevens, T. H., & Weatherhead, D. 2005. Is cheap talk effective at eliminating hypothetical bias in a provision point mechanism? *Environmental and Resource Economics* 30: 327-343.
- Norwood, F. B. 2005. Can calibration reconcile stated and observed preferences? *Journal of Agricultural and Applied Economics* 37: 237-248.
- Opaluch, J. J., & Segerson, K. 1989. Rational Roots of "Irrational" Behavior: New Theories of Economic Decision-Making. *Northeastern Journal of Agricultural Economics* 18: 81-95.
- Poe, G. L., Clarke, J., Rondeau, D., & Schulze, W. D. 2002. Provision point mechanisms and field validity tests of contingent valuation. *Environmental and Resource Economics* 23: 105-131.
- Ready, R. C., Navrud, S., & Dubourg, R. W. 2001. How do respondents with uncertain willingness to pay answer contingent valuation questions? *Land Economics* 77(3): 315-326.
- Ready, R. C., Whitehead, J. C., & Blomquist, G. C. 1995. Contingent Valuation When Respondents Are Ambivalent. *Journal of Environmental Economics and Management* 29: 181-196.
- Reber, A. S. 1985. *The Penguin dictionary of psychology*. London: Penguin Books.
- Taylor, L. O. 1998. Incentive compatible referenda and the valuation of environmental goods. *Agricultural and Resource Economics Review* 27(2): 132-139.
- Taylor, L. O., McKee, M., Laury, S. K., & Cummings, R. G. 2001. Induced-value tests of the referendum voting mechanism. *Economic Letters* 71(1): 61-65.
- Vossler, C. A., & McKee, M. 2006. Induced-value tests of contingent valuation elicitation mechanisms. *Environmental and Resource Economics* 35(2): 137-168.

**Tables****Table 1. Sample sizes**

Treatment	Bid level			Total
	\$10	\$15	\$20	
Actual payment	47	50	41	138
Hypothetical with certainty scale	47	47	57	151
Hypothetical with cheap talk	67	47	33	147
Hypothetical with DM format	61	59	54	174

**Table 2. Socio-demographic and attitudinal characteristics of subjects in each treatment, by bid level**

	Actual payment			H-certainty scale		
	\$10	\$15	\$20	\$10	\$15	\$20
% FEMALE	51	40	63	45	45	32
% WORK PART-TIME	55	38	49	49	51	53
% SELF-RESPONSIBLE	26	24	20	21	32	34
INTEREST	2.43	2.45	2.39	2.59	2.28	2.60
	H-cheap talk			H-DM format		
	\$10	\$15	\$20	\$10	\$15	\$20
% FEMALE	62	47	58	21	56	35
% WORK PART-TIME	49	40	58	47	34	61
% SELF-RESPONSIBLE	22	21	15	31	36	27
INTEREST	2.51	2.45	2.45	2.65	2.48	2.59

Note: SELF-RESPONSIBLE refers to those who are responsible for their own tuition and living expenses, and INTEREST is a 4-point rating scale question indicating respondents' interest in the Breakfast Club Program, where 1 is not at all interested and 4 is very interested.



**Table 3. Percentage of subjects voting yes across treatments and bid levels**

Bid level	Treatment				
	Actual payment	Hypothetical	H-cert7	H-cheap talk	H-DM format
\$10	49	74	49	39	46
\$15	46	57	43	36	41
\$20	44	53	40	27	43
All	46	61	44	35	43

**Table 4. Binomial z-test results (p-value) for comparisons of each of the four hypothetical estimates with the actual payment estimate**

Bid level	Actual payment compared with:			
	Hypothetical	H-cert7	H-cheap talk	H-DM format
\$10	0.000	0.556	0.102	0.392
\$15	0.063	0.364	0.099	0.266
\$20	0.005	0.380	0.000	0.493

**Table 5. Regression models showing the effect of treatment, socio-demographic and attitudinal variables on voting behaviour**

Variable	Model 1: All variables and data included	Model 2: CERT7 included instead of H-NC
BID	-0.054** (0.023)	-0.036 (0.023)
H-DM	-0.216 (0.253)	-0.205 (0.252)
H-CT	-0.614** (0.260)	-0.593** (0.259)
H	0.623** (0.264)	
H-Cert7		-0.162 (0.261)
SELF-RESPONSIBLE	-0.538*** (0.214)	-0.438** (0.212)
WORK PART-TIME	0.444** (0.185)	0.508*** (0.184)
FEMALE	0.383** (0.185)	0.431** (0.183)
INTEREST	0.608*** (0.114)	0.584*** (0.113)
Constant	-1.499*** (0.529)	-1.829*** (0.534)
Rho squared	0.095	0.073

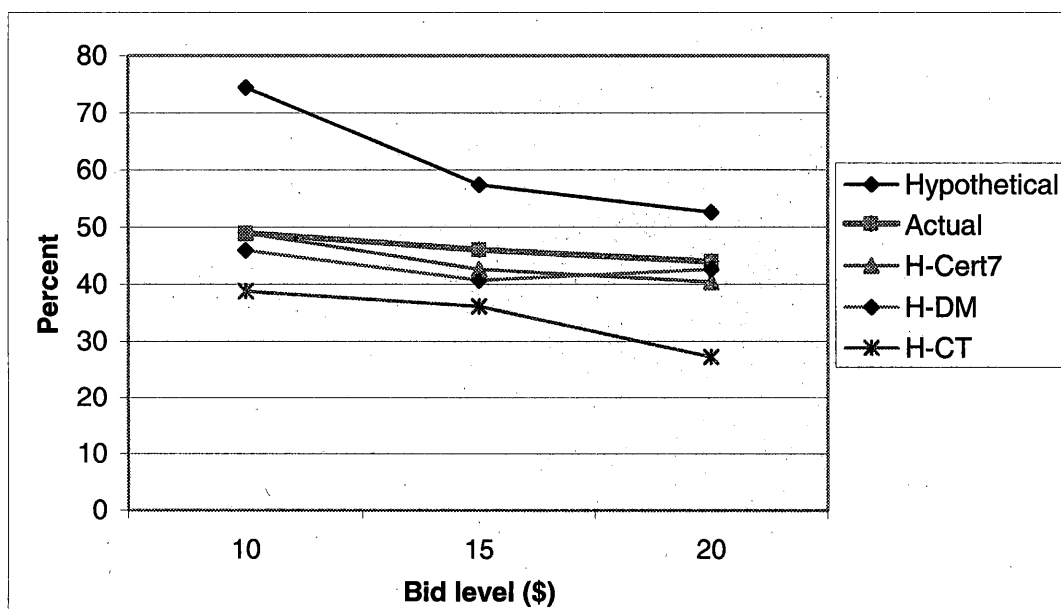
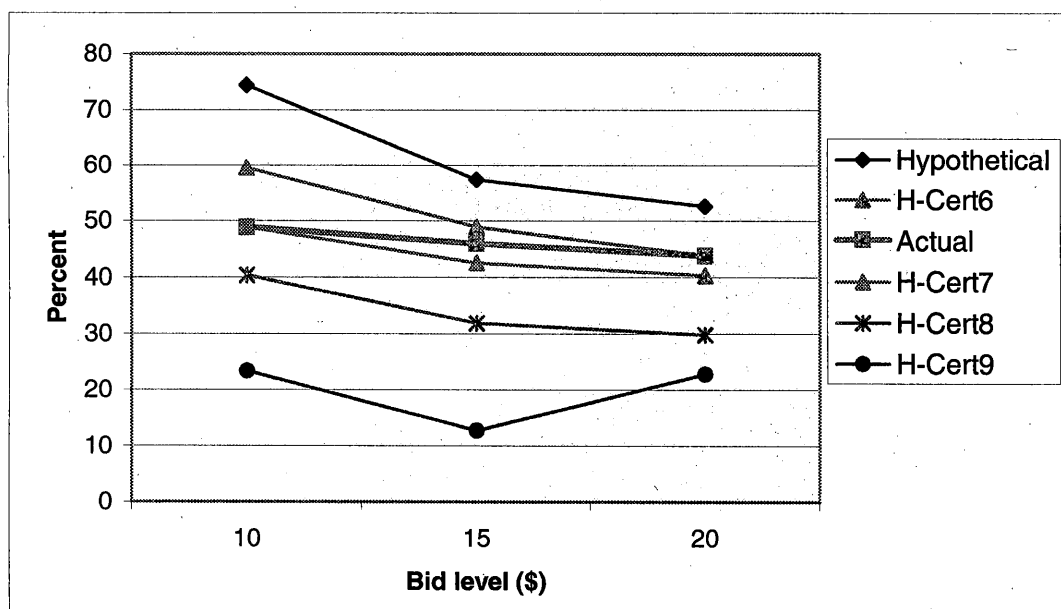
Notes: standard errors are in parentheses

\*\*\* significant at 1% level, \*\* significant at 5% level, \* significant at 10% level

BID = bid level, H-DM = dissonance-minimizing treatment, H-CT = cheap talk treatment, H-Cert7 = certainty-7 correction, H = hypothetical treatment with no correction.

**Table 6. Distribution of responses across categories in the H-DM treatment**

Response category	Bid level		
	\$10	\$15	\$20
I would vote YES to this proposal that everyone contribute \$X to the Breakfast Club	28	24	23
I support the goal of the Breakfast Club, but I'm not prepared to pay \$X and thus would vote NO.	5	3	2
I support the goal of the Red Cross Breakfast Club, but I cannot afford \$15 and thus would vote NO.	11	15	15
I support the goal of the Red Cross Breakfast Club, but I would prefer to save my money and contribute to another cause and thus would vote NO.	9	12	10
I support the goal of the Breakfast Club initiative, but I would vote NO for the following reason _____	3	4	0
I would vote NO to this proposal that everyone contribute \$X to the Breakfast Club.	6	1	4
Total	62	59	54

**Figure 1: Percentage of subjects voting yes across treatments and bid levels****Figure 2: Percentage of subjects voting yes at various certainty scale cut-offs**

## Appendix: Questionnaires

### 1. Real Payment Questionnaire

This is a study about the decisions people make. We will be describing to you a problem facing many children in Australia, and a non-profit organisation that is working on this problem. As a group, you will be given the opportunity to contribute to this organisation.

#### The Problem: Children Missing Breakfast

It is estimated that one in four Australian school children have an inadequate breakfast or no breakfast at all. These rates are higher in schools in disadvantaged areas, as children from lower socio-economic backgrounds are six times more likely to miss breakfast than children from higher socio-economic backgrounds.

Many nutritionists consider breakfast to be the most important meal of the day, assisting in children's physical, mental and emotional development. Children who miss breakfast are less able to concentrate, are more prone to fidgeting, and find learning difficult by mid-morning. Children therefore especially need an adequate breakfast to participate well at school.

#### The Solution

The *Australian Red Cross NSW* has started a Breakfast Club initiative that provides about 80 000 breakfasts a year to school children in 26 centres in New South Wales. The program runs in disadvantaged schools across New South Wales, with *Red Cross* volunteers providing children with cereal, toast and juice before they start class.

This initiative has:

- provided better nutrition for children in a comforting and supportive environment;
- lead to an improvement in the children's concentration in the classroom, leading to children achieving better grades; and
- encouraged children to develop vital social and living skills.

The Breakfast Club is funded solely by donations from the Australian public and relies mostly on the work of volunteers.

Because the *Red Cross* relies on donations, the number of meals it can provide to children each year through the Breakfast Club depends on the funds received. If more money were given, *Red Cross* would be able to provide additional meals to needy children who currently are not receiving these meals. So in a moment we are going to ask if you would like, as a group, to contribute money towards the Breakfast Club initiative.

#### Donating to the Red Cross Breakfast Club Initiative



If you would like additional breakfasts to be provided to needy school children through the *Red Cross* Breakfast Club, you and the others in the room will need to donate.

It costs \$10 to buy *Red Cross* breakfasts for one week for a child living in a disadvantaged area.

There are reasons why you might want to make a donation towards the Breakfast Club, and there are reasons why you might not want to make a donation. For instance:

- The Breakfast Club does provide disadvantaged children with healthy breakfasts each week.
- But you might think the cost of donating to the Breakfast Club is more than you are willing to spend on it. Or you might have some other reason for not making a donation.

When thinking about whether or not you will support the Breakfast Club, keep in mind your available income and all of the other things you have to spend money on.

### **How Contributions Will Work**

In a moment we are going to hold a secret ballot to decide whether or not you and each other participant in the room will contribute \$10 to buy *Red Cross* breakfasts for additional children.

Here's how it will work. After you have each voted about whether you want to contribute towards providing *Red Cross* breakfasts, one of us will collect your voting slips.

1. If more than 50% of you vote YES to this proposal, all of you will pay \$10.

I will deduct \$10 from the money that each of you earned for participating in these experiments and a cheque for this amount ( $\$10 \times \text{ \_\_\_\_\_\_ people} = \$\text{ \_\_\_\_\_\_}$ ) will be sent to the *Australian Red Cross*, who will send each of you a receipt for your contribution.

2. If 50% or fewer of you vote YES on this proposal, no one will pay \$10, and no money will be sent to the *Australian Red Cross*.

### **Review**

We have described to you a program run by the *Australian Red Cross* to provide breakfasts to children in disadvantaged areas. The program is funded by donations from the public, so the number of breakfasts provided each week depends on the donations received.

In a moment you will be voting to decide whether each of you will contribute \$10 towards providing *Red Cross* breakfasts for additional children in a disadvantaged area.

But before you do, I want to make it clear that the \$20 participation fee that you will be paid today is your money. You've spent your time helping us in our research, and you've earned it! You were told that the money is yours, so believe it!

Any questions?

---

### **Voting Slip**

Proposal: Everyone here in this room will contribute \$10 to provide *Red Cross* breakfasts for additional children in a disadvantaged area.

*Please choose one of the following options:*

☐

I vote YES to this proposal that everyone contribute \$10 to the Breakfast Club.

☐

I vote NO to this proposal that everyone contribute \$10 to the Breakfast Club.

---

## 2. DC\_Hypothetical Questionnaire

This is a study about the decisions people make. We will be describing to you a problem facing many children in Australia, and a non-profit organisation that is working on this problem. You are not actually being given the opportunity to contribute to this organization today. We will be presenting you with a hypothetical situation. Even though payment of money in this experiment is hypothetical, we ask that you respond to the questions as if they involved real cash payments.

### The Problem: Children Missing Breakfast

It is estimated that one in four Australian school children have an inadequate breakfast or no breakfast at all. These rates are higher in schools in disadvantaged areas, as children from lower socio-economic backgrounds are six times more likely to miss breakfast than children from higher socio-economic backgrounds.

Many nutritionists consider breakfast to be the most important meal of the day, assisting in children's physical, mental and emotional development. Children who miss breakfast are less able to concentrate, are more prone to fidgeting, and find learning difficult by mid-morning. Children therefore need an adequate breakfast to participate well at school.

### The Solution

The *Australian Red Cross NSW* has started a Breakfast Club initiative that provides about 80 000 breakfasts a year to school children in 26 centres in New South Wales. The program runs in disadvantaged schools across New South Wales, with *Red Cross* volunteers providing children with cereal, toast and juice before they start class.

This initiative has:

- provided better nutrition for children in a comforting and supportive environment;
- lead to an improvement in the children's concentration in the classroom, leading to children achieving better grades; and
- encouraged children to develop vital social and living skills.

The Breakfast Club is funded solely by donations from the Australian public and relies on the work of volunteers.

Because the *Red Cross* relies on donations, the number of meals it can provide to children each year through the Breakfast Club depends on the funds received. If more money were given, *Red Cross* would be able to provide additional meals to needy children who currently are not receiving these meals. So in a moment we are going to ask if you would like, as a group, to contribute money towards the Breakfast Club initiative.

### Donating to the Red Cross Breakfast Club Initiative

If you would like additional breakfasts to be provided to needy school children through the *Red Cross* Breakfast Club, you and the others in the room would need to donate.

It costs \$10 to buy *Red Cross* breakfasts for one week for a child living in a disadvantaged area.

There are reasons why you might want to make a donation towards the Breakfast Club, and there are reasons why you might not want to make a donation. For instance:

- The Breakfast Club does provide disadvantaged children with healthy breakfasts each week.
- But you might think the cost of donating to the Breakfast Club is more than you are willing to spend on it. Or you might have some other reason for not making a donation.

When thinking about whether or not you would support the Breakfast Club, keep in mind your available income and all of the other things you have to spend money on.

### How Contributions Would Have Worked

In a moment we are going to hold a secret ballot to decide whether or not you and each other participant in the room would contribute \$10 to buy *Red Cross* breakfasts for additional children.

Here's how it will work. After you have each voted about whether you would want to contribute towards providing *Red Cross* breakfasts, one of us will collect your voting slips.

1. If more than 50% of you vote YES to this proposal, all of you would – if this experiment were for real – pay \$10.

I would deduct \$10 from the money that each of you earned for participating in these experiments and a cheque for this amount ( $\$10 \times \text{_____ people} = \$\text{_____}$ ) would be sent to the *Australian Red Cross*, who would send each of you a receipt for your contribution.

2. If 50% or fewer of you vote YES on this proposal, no one would pay \$10, and no money would be sent to the *Australian Red Cross*.

### Review

We have described to you a program run by the *Australian Red Cross* to provide breakfasts to children in disadvantaged areas. The program is funded by donations from the public, so the number of breakfasts provided each week depends on the donations received.

In a moment you will be voting to decide whether each of you would contribute – if this experiment were for real – \$10 towards providing *Red Cross* breakfasts for additional children in a disadvantaged area.

While this experiment is hypothetical, we would like you to respond to this question as if we were actually giving you the opportunity to contribute to the *Red Cross* today.

But before you do, I want to make it clear that the \$20 participation fee that you will be paid today is your money. You've spent your time helping us in our research, and you've earned it! You were told that the money is yours, so believe it!

Any questions?

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## Voting Slip

Proposal: Everyone here in this room would contribute \$10 to provide *Red Cross* breakfasts for additional children in a disadvantaged area.

*Please choose one of the following options:*

☐

I would vote YES to this proposal that everyone contribute \$10 to the Breakfast Club.

☐

I would vote NO to this proposal that everyone contribute \$10 to the Breakfast Club.

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### 3. Cheap Talk Questionnaire

This is a study about the decisions people make. We will be describing to you a problem facing many children in Australia, and a non-profit organisation that is working on this problem. You are not actually being given the opportunity to contribute to this organization today. We will be presenting you with a hypothetical situation. Even though payment of money in this experiment is hypothetical, we ask that you respond to the questions as if they involved real cash payments.

#### **The Problem: Children Missing Breakfast**

It is estimated that one in four Australian school children have an inadequate breakfast or no breakfast at all. These rates are higher in schools in disadvantaged areas, as children from lower socio-economic backgrounds are six times more likely to miss breakfast than children from higher socio-economic backgrounds.

Many nutritionists consider breakfast to be the most important meal of the day, assisting in children's physical, mental and emotional development. Children who miss breakfast are less able to concentrate, are more prone to fidgeting, and find learning difficult by mid-morning. Children therefore need an adequate breakfast to participate well at school.

#### **The Solution**

The *Australian Red Cross NSW* has started a Breakfast Club initiative that provides about 80 000 breakfasts a year to school children in 26 centres in New South Wales. The program runs in disadvantaged schools across New South Wales, with *Red Cross* volunteers providing children with cereal, toast and juice before they start class.

This initiative has:

- provided better nutrition for children in a comforting and supportive environment;
- lead to an improvement in the children's concentration in the classroom, leading to children achieving better grades; and
- encouraged children to develop vital social and living skills.

The Breakfast Club is funded solely by donations from the Australian public and relies mostly on the work of volunteers.

Because the *Red Cross* relies on donations, the number of meals it can provide to children each year through the Breakfast Club depends on the funds received. If more money were given, *Red Cross* would be able to provide additional meals to needy children who currently are not receiving these meals. So in a moment we are going to ask if you would like, as a group, to contribute money towards the Breakfast Club initiative.

#### **Donating to the Red Cross Breakfast Club Initiative**

If you would have liked additional breakfasts to be provided to needy school children through the *Red Cross* Breakfast Club, you and others in the room would need to donate.

It costs \$10 to buy *Red Cross* breakfasts for one week for a child living in a disadvantaged area.

There are reasons why you might want to make a donation towards the Breakfast Club, and there are reasons why you might not want to make a donation. For instance:

- The Breakfast Club does provide disadvantaged children with healthy breakfasts each week.
- But you might think the cost of donating to the Breakfast Club is more than you are willing to spend on it. Or you might have some other reason for not making a donation.

When thinking about whether or not you would support the Breakfast Club, keep in mind your available income and all of the other things you have to spend money on.

### **How Contributions Would Have Worked**

In a moment we are going to hold a secret ballot to decide whether or not you and other participant in the room would contribute \$10 to buy *Red Cross* breakfasts additional children.

Here's how it will work. After you have each voted about whether you wanted to contribute towards providing *Red Cross* breakfasts, one of us will collect your voting slips.

1. If more than 50% of you had voted YES to this proposal, all of you would – if this experiment were for real – pay \$10

I would have deducted \$10 from the money that each of you earned for participating in these experiments and a cheque for this amount ( $\$10 \times \text{_____ people} = \$\text{_____}$ ) would be sent to the *Australian Red Cross*, who would send each of you a receipt for your contribution.

2. If 50% or fewer of you vote YES on this proposal, no one would pay \$10, and no money would be sent to the *Australian Red Cross*.

Before you vote, I want to talk to you about a problem that we have in studies like this one. As I told you a minute ago, this is a hypothetical choice, not a real one. No one will actually pay money after making their choice. But I have also asked you to respond to the decision as though the result of your vote would involve a real cash payment by you.

And that's the problem.

In most studies of this kind, people seem to have a hard time doing this. They act differently in a hypothetical situation, where they don't really have to pay money, than they do in a real situation, where they could have to pay money. For example, in a recent study, several different groups of people made decisions just like this one you are about to make. Payment was hypothetical for these groups, as it will be for you. No one had to pay money in this hypothetical situation. The results of these studies were that on average, across the groups, 38% of them decided to contribute. With another set of groups with similar people deciding on the same situation as you will decide on here, but where the payment was real and people really did have to pay money if they said yes, the results on average, across the groups were that 25% decide to contribute. That's quite different isn't it?

We call this a 'hypothetical bias.' 'Hypothetical bias' is the difference that we continually see in the way people respond to hypothetical situations as compared to real situations, people seem to respond just like you see here on the overhead.

In the real situation, where people knew they would have to pay money if they decided to contribute, 25% said 'yes' and 75% said 'no.' When payment was hypothetical and people knew they would not pay anything if they decided to contribute, just like your decision today, 38% said 'yes' and 62% said 'no.'

How can we get people to think about their decision in a hypothetical situation like they think in a real situation? How do we get them to think about what it means to really dig into their pay money, if in fact they are really not going to do it?

Let me tell you why I think that we continually see this hypothetical bias, why people behave differently in a hypothetical situation than they do when the situation is real. I think that when we hear about a situation that involved doing something that is basically good, for example helping people in need, improving environmental quality, or anything else, our basic reaction in a hypothetical situation is to think: sure, I really would spend the money; I really, really, think that I would. What our 'yes' vote really means in this case, is that we are basically good people, and that we would like to see good things happen.

But when the situation is real, and we would actually have to spend our money, we think a different way. We basically still would like to see good things happen, but when we are faced with the possibility of having to spend money, we think about our options: If I spend money on this, that's money I don't have to spend on other things. If I spend money to help on this cause, that's money I don't have to spend on other things such as food, or rent, a movie or perhaps some other worthy cause. So, when the payment is real, we act in a way that takes into account the limited amount of money we have. We decide realising that we just don't have enough money to do everything we might like to do. This is just my opinion, of course, but it's what I think may be going on in the hypothetical situation.



In any case, the only way that we know to get people to decide in our hypothetical situation just like you would if the situation was real is to simply ask you, in the decision that we're going to make in a few minutes to please do the following:

Think about what you are deciding on. If this were real, if you said yes, you would actually have to dig into your pocket and pay \$10 right now, do you really want to fund the **Red Cross Breakfast Club** enough that you would be willing to spend the money?

If I were in your shoes, and I was asked to decide 'yes' or 'no' on this proposition that requires me to spend \$10, I would think about how I feel about spending my money this way. When I got ready to decide, I would ask myself: if this was a real situation, and I had to pay \$10, do I really want to spend my money this way. If I really did, I would say yes, if I didn't I would say no. I wouldn't throw my money around. That's just my opinion of course. You must do whatever you want to do.

In any case, I ask you to decide exactly as you would if you were really going to face the consequences of your decision: which is to pay money if you say yes to contribute.

Please keep this in mind when deciding whether you would contribute to this cause.

## Review

We have described to you a program run by the *Australian Red Cross* to provide breakfasts to children in disadvantaged areas. The program is funded by donations from the public, so the number of breakfasts provided each week depends on the donations received.

In a moment you will be voting to decide whether each of you would contribute – if this experiment were for real – \$10 towards providing a *Red Cross* breakfast for one week for an additional child in a disadvantaged area.

While this experiment is hypothetical, we would like you to respond to this question as if we were actually giving you the opportunity to contribute to the *Red Cross* today.

But before you do, I want to make it clear that the \$20 participation fee that you will be paid today is your money. You've spent your time helping us in our research, and you've earned it! You were told that the money is yours, so believe it!

Any questions?

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## Voting Slip

Proposal: Everyone here in this room would contribute \$10 to provide *Red Cross* breakfasts for additional children in a disadvantaged area.

*Please choose one of the following options:*

☐ I would vote YES to this proposal that everyone contribute \$10 to the Breakfast Club.

☐ I would vote NO to this proposal that everyone contribute \$10 to the Breakfast Club.

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#### 4. Dissonance Minimising Questionnaire

This is a study about the decisions people make. We will be describing to you a problem facing many children in Australia, and a non-profit organisation that is working on this problem. You are not actually being given the opportunity to contribute to this organization today. We will be presenting you with a hypothetical situation. Even though payment of money in this experiment is hypothetical, we ask that you respond to the questions as if they involved real cash payments.

##### The Problem: Children Missing Breakfast

It is estimated that one in four Australian school children have an inadequate breakfast or no breakfast at all. These rates are higher in schools in disadvantaged areas, as children from lower socio-economic backgrounds are six times more likely to miss breakfast than children from higher socio-economic backgrounds (O'Dea, J. Children's Nutrition and Physical Activity Study, The University of Sydney, 2001).

Many nutritionists consider breakfast to be the most important meal of the day, assisting in children's physical, mental and emotional development. Children who miss breakfast are less able to concentrate, are more prone to fidgeting, and find learning difficult by mid-morning. Children therefore need an adequate breakfast to participate well at school.

##### The Solution

The *Australian Red Cross NSW* has started a Breakfast Club initiative that provides about 80,000 breakfasts a year to school children in 26 centers in New South Wales. The program runs in disadvantaged schools across New South Wales, with *Red Cross* volunteers providing children with cereal, toast and juice before they start class.

This initiative has:

- provided better nutrition for children in a comforting and supportive environment;
- lead to an improvement in the children's concentration in the classroom, leading to children achieving better grades; and
- encouraged children to develop vital social and living skills.

The Breakfast Club is funded solely by donations from the Australian public and *relies* mostly on the work of volunteers.

Because the *Red Cross* relies on donations, the number of meals it can provide to children each year through the Breakfast Club depends on the funds received. If more money were given, *Red Cross* would be able to provide meals to needy children who currently are not receiving these meals. So in a moment we are going to ask if you would like, as a group, to contribute money towards the Breakfast Club initiative.

## Donating to the Red Cross Breakfast Club Initiative

If you would like additional breakfasts to be provided to needy school children through the *Red Cross* Breakfast Club, you and the others in the room would be need to donate.

It costs \$15 to buy *Red Cross* breakfasts for one week for a child living in a disadvantaged area.

There are reasons why you might want to make a donation towards the Breakfast Club, and there are reasons why you might not want to make a donation. For instance:

- The Breakfast Club does provide disadvantaged children with healthy breakfasts each week.
- But you might think the cost of donating to the Breakfast Club is more then you are willing to spend on it. Or you might have some other reason for not making a donation.

When thinking about whether or not you would support the Breakfast Club, keep in mind your available income and all of the other things you have to spend money on.

## How Contributions Would Have Worked

In a moment we are going to hold a secret ballot to decide whether or not you and each other participant in the room would contribute \$15 to buy *Red Cross* breakfasts for additional children.

Here's how it will work. After you have each voted about whether you wanted to contribute towards providing a *Red Cross* breakfast, one of us will collect your voting slips.

1. If more than 50% of you had voted YES to this proposal, all of you would – if this experiment were for real – pay \$15

I would have deducted \$15 from the money that each of you earned for participating in these experiments and a cheque for this amount ( $\$15 \times \text{____ people} = \$\text{_____}$ ) would be sent to the *Australian Red Cross*, who would send each of you a receipt for your contribution.

2. If 50% or fewer of you vote YES on this proposal, no one would pay \$15, and no money would be sent to the *Australian Red Cross*.

## Review

We have described to you a program run by the *Australian Red Cross* to provide breakfasts to children in disadvantaged areas. The program is funded by donations from the public, so the number of breakfasts provided each week depends on the donations received.

In a moment you will be voting to decide whether each of you would contribute – if this experiment were for real – \$15 towards providing a *Red Cross* breakfast for one week for an additional child in a disadvantaged area.

While this experiment is hypothetical, we would like you to respond to this question as if we were actually giving you the opportunity to contribute to the *Red Cross* today.

But before you do, I want to make it clear that the \$20 participation fee that you earned today is your money. You've spent your time helping us in our research, and you've earned it! You were told that the money is yours, so believe it!

Any questions?

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## Voting Slip

Proposal: Everyone here in this room will contribute \$15 to provide *Red Cross* breakfasts for additional children in a disadvantaged area.

*Please choose one of the following options:*

- ☐ I would vote YES to this proposal that everyone contribute \$15 to the Breakfast Club.
- ☐ I support the goal of the Breakfast Club, but I'm not prepared to pay \$15 and thus would vote NO.
- ☐ I support the goal of the Red Cross Breakfast Club, but I cannot afford \$15 and thus would vote NO.
- ☐ I support the goal of the Red Cross Breakfast Club, but I would prefer to save my money and contribute to another cause and thus would vote NO.
- ☐ I support the goal of the Breakfast Club initiative, but I would vote NO for the following reason \_\_\_\_\_
- ☐ I would vote NO to this proposal that everyone contribute \$15 to the Breakfast Club.

## Socio-demographics questionnaire

This information is completely confidential, please do not write your name anywhere on this document. There is an ID number written on this questionnaire so that we can keep your answers to this questionnaire together with your other answers in this experiment.

1. What is your age? \_\_\_\_\_
2. What is your gender? *Please circle one response*  
01 Male                      02 Female
3. What is your marital status?  
01 Married                      03 Divorced/ Separated  
02 Single                      04 Widowed
4. How would you best describe your employment situation? (circle one)  
01 Full time employment outside of the university  
02 Part time employment outside of the university  
03 Student only  
04 Work at the university/ research assistantship  
05 Unemployed, seeking work  
06 Other (please specify) \_\_\_\_\_
5. Who in your household do you consider to be primarily in charge of expenses and budget decisions?  
01 Self  
02 Spouse  
03 Parent  
04 Other \_\_\_\_\_
6. Please indicate the income category that best describes your household income from all sources before taxes last year. We are defining household to mean yourself and those that live with you and share your income and expenses.  
01 5,000 or less                      06 60,001 to 75,000  
02 5,001 to 15,000                      07 75,001 to 90,000  
03 15,001 to 30,000                      08 90,001 to 100,000  
04 30,001 to 45,000                      09 100,001 or more  
05 45,001 to 60,000
7. How many people are in your household? Again, we are defining household to mean yourself and those that live with you and share your income and expenses.

01 \_\_\_\_\_

8. The following are the same income categories, but this time respond for your own income from all sources (salary, stipend, gifts, investments, etc.) before taxes last year. Do not include income from other household members.

01 5,000 or less	06 60,001 to 75,000
02 5,001 to 15,000	07 75,001 to 90,000
03 15,001 to 30,000	08 90,001 to 100,000
04 30,001 to 45,000	09 100,001 or more
05 45,001 to 60,000	

9. How do you receive your income? *Circle all that apply*

01 Fixed source (salary pension)	04 Loans/ Scholarships
02 Hourly rate	05 Parents
03 Hourly rate + tips	06 Other (please specify) _____

10. What is your student status?

01 Full time student  
02 Part time student  
03 Other (please specify) \_\_\_\_\_

11. What course are you enrolled in?

01 \_\_\_\_\_

12. What year are you currently in?

01 First year	06 Doctoral Student
02 Second year	07 Other (please specify) _____
03 Third Year	
04 Fourth Year	
05 Master's student	

12. Who is primarily responsible for your tuition and living expenses while you are attending this university? *Circle all that apply*

01 Self	04 Loans
02 Parent	05 Centrelink
03 Scholarship/ grant	05 Other (please specify) _____

## Final questionnaire

This information is completely confidential, please do not write your name anywhere on this document. There is an ID number written on this questionnaire so that we can keep your answers to this questionnaire together with your other answers in this experiment.

**If you indicated you would vote YES to the proposal that everyone contribute to the Breakfast Club, please answer Question 1, otherwise go to Question 2.**

1. How certain are you that you would actually vote YES to the proposal that everyone contribute \$10 to the Breakfast Club if this experiment were for real?  
*Please circle one number*

Very Uncertain	1	2	3	4	5	6	7	8	9	10	Very Certain
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2. How interested are you in providing Children's Breakfasts through the Red Cross?

01 Very interested  
02 Moderately interested  
03 Slightly interested  
04 Not interested at all

3. Please indicate the extent to which you agree or disagree with the following statements. *Please circle one number in each row*

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The Red Cross Breakfast Program is a good idea.	1	2	3	4	5
The Red Cross Breakfast Program improves children's futures.	1	2	3	4	5
The Red Cross Breakfast Program will help children concentrate at school	1	2	3	4	5
I understood the information in the questionnaire.	1	2	3	4	5
I needed more information than was provided	1	2	3	4	5



4. When answering the questions asking whether you wanted to donate to the Red Cross Breakfast Program, if you **indicated you would vote NO to the proposal to contribute to the Breakfast Club**, what was your main reason for doing so?

*Please circle all that apply:*

- 01 I am simply not interested in the *Red Cross Breakfast Program*.
- 02 I support the program, but it is not worth that amount of money to me.
- 03 I did not think the *Red Cross Breakfast Program* would actually use my donation to give breakfast to a child.
- 04 I did not think giving a child breakfast would actually make a difference.
- 05 I felt the *Red Cross Breakfast Program* would receive enough funds without my donation.
- 06 I think the government should pay for children's breakfasts.
- 07 I prefer to donate to other organisations and charities.
- 08 I did not donate money because of the way I was asked.
- 09 I felt the requested donations were too much to pay for a week of breakfasts.
- 10 Other, please specify: \_\_\_\_\_

5. Please indicate the extent to which you agree or disagree with the following statements. *Please circle one number in each row*

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I have no trouble getting off the phone when called by a person selling something I don't want.	1	2	3	4	5
I really don't know how to deal with aggressive salespeople.	1	2	3	4	5
More often than I would like, I end up buying something I don't want because I have a hard time saying no to the salesperson.	1	2	3	4	5
If a salesperson comes to my door selling something I don't want, I have trouble ending the conversation.	1	2	3	4	5
If a salesperson has gone to a lot of trouble to find an item for me, I would be embarrassed	1	2	3	4	5

not to buy it even if it isn't exactly right.					
I sometimes don't get all the information I need about a product because I am uncomfortable bothering salespeople with questions.	1	2	3	4	5
I am uncomfortable asking store employees where products are located in the store.	1	2	3	4	5
In signing a sales contract or credit agreement, I am reluctant to ask for an explanation of everything I don't understand.	1	2	3	4	5
If a store doesn't have the size or colour of an item I need, I don't mind asking the salesperson to check for the item at other store locations.	1	2	3	4	5
If a cashier is talking with friends while I am waiting to be waited on, it would not bother me to interrupt the conversation and ask for assistance.	1	2	3	4	5
If a defective product is inexpensive, I usually keep it rather than put up a fuss or complain.	1	2	3	4	5
I'd rather do almost anything than return a product to the store.	1	2	3	4	5
I am probably more likely to return an unsatisfactory product than most people I know.	1	2	3	4	5
I often procrastinate when I know I should return a defective product to the store.	1	2	3	4	5
I would attempt to notify store management if I thought service in a store was particularly bad.	1	2	3	4	5

**Thank you very much for your participation.**